

**A Graded Approach for Initiating Event Selection in a Facility Hazard Analysis \***

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**Abstract**

This paper describes a methodology for selecting initiating events or event scenarios for a hazard analysis of a DOE facility. The selection process is a very important first step in conducting the hazard analysis for the facility, which in turn may feed into a quantitative risk analysis. A comprehensive risk analysis is dependent on the identification and inclusion of a complete set of initiating events in the analysis model. A systematic and logical method of grading or screening all the potential initiating events satisfies the needs for completeness within the bounds of efficiency and practicality.

This method is called a grading technique in this paper. The technique basically consists of three elements:

- 1) Identifying a complete set of initiating events in broad categories, containing lower tier types and origins.
- 2) Defining two axes of selection criteria based on frequency and consequence.
- 3) Applying these criteria to grade the events identified in item 1 under two levels of rigor as appropriate, either engineering judgment or engineering analysis. The grading ascertains significance of the events, selecting those significant events for further consideration in the next phase of the risk analysis, which is the task and hazard analysis.

This methodology is used in the risk analysis of a new DOE facility called the Device Assembly Facility (DAF) at the Nevada Test Site. This paper illustrates the method by using the DAF risk analysis as an example. The application of this method for the DAF risk analysis resulted in selection of two events out of 40 external and natural phenomena events, and two events internal to the facility, out of 82 events identified in that hazard category. The third set of events was related to human error initiators. In this category 27 events were identified and all of them were selected for hazard analysis. Since the operations in this facility are dominated by manual activity it is expected to have more human action related event scenarios than hardware related scenarios.

By applying this graded approach to the selection of initiating events, the task and hazard analysis was able to focus its attention on only those events having the potential to develop into credible accident scenarios. Resources were concentrated into the understanding of those scenarios, and assuring that adequate positive measures are in place to control the risk represented there.

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